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CRUSTACEA

COMPILED BY

J. P. HARDING, Ph.D.

AND

R. W. INGLE

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10. CRUSTACEA

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Baffoni, G. M.; ablation of ocular peduncles in *Carcinus*, **Lenel, R.**; Integumental pigment, *Asellus*, **Needham, A. E. & Brunet, P. C. J.**; *Cambarus*, **Wells, P. H. & Witt, A.**; *Cambarellus*, dimorphism, **Volpe, E. P. & Penn, G. H.**; *Cambarellus*, **Fingerman, M. & Lowe, M. E. (1) & (2) & (3)**; Chromatophores, *Hippolyte*, **Chassard, C.**; Black discoloration of Lobster, **Kakimoto, D. & Kanazawa, A.**

Bioluminescence.—**Harvey, E. N., Chase, A. M. & McElroy, W. D.**; **Haneda, Y.**

Ecdysis.—**Carlisle, D. B.**; Excystation of parasitic ciliates, **Trajer, W.**; Mysidae, **Nouvel, H. (1)**; *Palaemonetes*, **Broad, A. C.**; *Pachygrapsus*, **Roberts, J. L.**; *Panulirus*, **Travis, D. F.**; *Sesarma*, **Jyssum, S. & Passano, L. M.**; *Stenassellus*, **Husson, R.**

Biochemistry.—**Roush, A. H. & Betz, R. F.**; Proteolysis in Crustacea, **Degkwitz, E.**; **Duchateau, C. & Florkin, M.**; **Maxfield, M. & Hartley, R. W., Jr.**; haemoglobin, **Fox, H. M. (1)**; **Foster, A. B. & Hackman, R. H.**; Chemical embryology, **Dutrieu, J.**; Mercury poisons, **Cornor, E. D. J.**; Biophysics, ions and membranes, **Stephenson, W. K.**; Amino acid content of marine borers, **Drisko, R. W. & Hochman, H.**; Fatty acid in *Calanus* oil, **Saiki, M. & Mori, T.**; Proteins, lipids and glucides in *Artemia* eggs. **Fautrez-Firlefyn, N.**; Dipeptidases and proteinases in development of *Artemia*, **Bellini, L.**; *Astacus*, fluorescent substances, **Viscontini, M., Schmid, H. & Hadorn, E.**; Eyestalk and brain extract, *Astacus*, **Crangon**, **Koller, G. & Kuhnen, H.**; *Carcinus*, **Degkwitz, E. (1)**; "organes jaunes" in *Caecospaeroma*, **Husson, R. & Schorr, H.**; Carotenoids in *Daphnia*, **Green, J. (1)**; Iron and haemoglobin breakdown in *Daphnia*, **Smaridge, M. W.**; Effects of amino acids on perfused lobster heart, **Enger, P. E. S. & Burgen, A. S. V.**; Black discoloration of lobster, **Kakimoto, D. & Kanazawa, A.**; *Maia*, **Zuckerkindl, E. (2) & (3)**; *Mesidotea*, chloride regulation, **Lockwood, A. P. M. & Croghan, P. C.**

Vitamins.—Penaeidea, **Fisher, L. R., Kon, S. K. & Thompson, S. Y.**; **Fisher, L. R., Kon, S. K. & Plack, P. A.**

REPRODUCTION AND SEX

Reproduction.—Parthenogenetic reproduction in *Leptodora* and *Bythotrephes*, **Mordukhai-Boltovskaya**; **Anomura, Matthews, D. C.**; **Asellus, Tadini, G. V.**; **Balanus, Barnes, H. & Barnes, M.**; Diatom increase and spawning of barnacles, **Barnes, H. (4)**; Copulation in Copepods, **Gauld, D. T. (3)**; *Cyclops*, **Grave, E. V.**; copepods, **Chiba, T.**; *Corycaeidae*, **Heberer, G.**; Reproduction of *Daphnia*, effects of suspended matter, **Robinson, M.**; *Euphausiacea*, **Zimmer, C. & Gruner, H. E.**; *Gammarus*, **Macan, T. T. & Mackereth, J. C.**; *Metoponorthus*, **Shimoizumi, M.**; *Orchestia*, **Charniaux-Cotton, H. (1)**; *Pandalus*, **Mistakidis, M. N.**; *Panulirus*, **George, R. W.**; *Paramysis*, **Labat, R.**; *Themisto*, **Dunbar, M. J.**

Secondary sex characters.—*Cambarellus* and *Procambarus*, **Penn, G. H.**

Sex dimorphism.—*Dromia* and *Pilumnus*, **Vernet-Cornubert, G.**; Chela of *Pisa*, **Vernet-Cornubert, G. (1)**.

Sex ratio.—Influenced by environment, **Metzler, S.**; Land Isopoda, **Meinertz, T.**; *Asellus*, **Vitagliano-Tadini, G.**, **Malquori, A. M. & Maffei, F.**; *Porcellio*, **Patanè, L. (1)**.

Hermaphrodites and intersexes.—Castration effect of epicaridean parasite of *Upogebia*, **Oguro, C.**; Gynandromorphism, *Armadillidium*, **Legend, J. J. (1)**; *Homarus*, **Gordon, I. (1)**; *Orchestia*, **Charniaux-Cotton, H.**; *Pandalus*, **Mistakidis, M. N.**; *Rhyscotoides*, **Johnson, G. (1) & (2)**; *Sphaeroma*, **Pigeault, N.**

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Phylogeny and ontogeny, **Spett, G. I.**; *Acartia*, **Conover, R. J. (1)**; Post-embryonic development of median eye of *Artemia*, **Vaissière, R.**; *Paguristes*, **Altes, J.**

Egg.—Resting eggs, **Røen, K. M.**; Egg number and size, **Ravera, O. & Tonolli, V.**; Number of eggs in ephippium of *Acantholeberis*, **Smyly, W. J. P. (2)**; Proteins, lipids and glucines in *Artemia* egg, **Fautrez-**

Firefyn, N.; Resting eggs of *Artemia*, **Dutrien, J.**; *Balanus*, **Barnes, H. & Barnes, M.**; Egg-sacs of marine copepods, figs., **Chiba, T.**; *Limnoria*, **Kampf, W. D.**

Gametogenesis.—Spermatophores, *Eurytemora*, *Euchaeta*, *Oncaea*, figs., **Chiba, T.**

Spermatogenesis.—*Anomura*, **Matthews, D. C.**; *Corycaeidae*, **Heberer, G.**; *Rhyscotoides*, **Johnson, G.**

Embryology.—X-organs in *Cran-gon*, **Dahl, E.**; *Euphausiacea*, **Zimmer, C. & Gruner, H. E.**; *Jaera*, **Lemercier, A.**; *Leander*, **Weill-Raynal, A.**; *Porcellio*, **Akahira, Y.**

Larval stages.—**Williamson, D. I.**; Tidal streams and larval distribution, **Evans, F. & Newell, G. E.**; Nauplius, *Amerira*, **Krishnaswamy, S. (1)**; *Argulus*, **Shen, C. J.**; *Balanus*, **Costlow, J. D. & Bookhout, C. G.**; *C. G. (1)*; Settlement and orientation of larvae, **Harvey, L. A.**; *Brachyura*, **Gohar, H. A. F. & Al-Kholy, A. A. (1-2)**; Barnacles, **Bousfield, E. L. (2)**; marine planktonic copepod nauplii, **Lovegrove, T.**; *Euphausiacea*, **Zimmer, C. & Gruner, H. E.**; *Eurytemora*, figs., **Chiba, T.**; *Leptastacus*, **Krishnaswamy, S. (5)**; *Neopanope*, **Chamberlain, N. A.**; *Paguridae*, **MacDonald, J. D., Pike, R. B. & Williamson, D. I.**; *Palae-monetes*, **Broad, A. C.**; *Panulirus*, **Harada, E.**; *Peltoastraea*, **Shirase, S. & Yanagimachi, R.**; Stomatopoda, **Gohar, H. A. F. & Al-Kholy, A. A.**; *Welleria*, **Kesling, R. V.**

Growth.—**Wilde, J. de**; Ontogeny of fossil ostracods, **Martinsson, A.**; Allometry, **Massal, M.**; morphology of *Acanthogammarus*, **Bazikalova, A. Y.**; *Balanus*, **Costlow, J. D. & Bookhout, C. G.**; growth of *Balanus*, **Savilov, A. I.**; *Balanus*, **Barnes, H. & Barnes, M.**; *Chthamalus*, **Barnes, H. (1)**; *Limnoria*, **Kampf, W. D.**; *Maia*—allometric growth, **Lavallard, R.**; *Orchestia*, **Charniaux-Cotton, H. (1)**; *Panulirus*, **Sutcliffe, W. H., Jr.**; *Panulirus*, **George, R. W.**; *Pisa*, chela, **Vernet-Cornubert, G. (2)**; *Themisto*, **Dunbar, M. J.**

Regeneration.—*Leander*, **Tchernigovtzeff, C.**; Chela of *Pisa*, **Vernet-**

Cornubert, G. (2) ; Sesarma, Jyssum, S. & Passano, L. M.

EVOLUTION AND GENETICS

Evolution.—Beyrichiid Ostracods, **Kesling, R. V. (4)** ; Malacostraca, **Siewing, R.** ; Malacostraca, **Glaessner, M. F.** ; Woodlice, **Vandel, A. (4) & (7)** ; Oniscoida, **Matsakis, J. (1)** ; Glacial relicts, **Segerstråle, S. G. (1)**.

Genetics.—**Bocquet, C.** ; *Artemia*, **Barigossi, C.** ; Hybridization, *Bosmina* and *Daphnia* spp., **Leider, K.** ; *Gammarus*, **Anders, F.** ; Chromosome numbers in Gammarids, **Orian, A. J. E. & Callan, H. G.** ; *Idotea*, **Hamelin, E.** ; *Porcellio*, **Legrand, J. J.** ; Oniscoida, **Legrand, J. J. (2)** ; *Tigriopus*, **Božić, B.** ; *Tisbe*, **Battaglia, B. & Pulze, E.**

Variation.—Dimorphism of fossil ostracods, **Martinsson, A.** ; Geographic variation, marine Harpacticid, **Battaglia, B.** ; Inheritance, Oniscoidea, **Legrand, J. J. (2)** ; Mutation, *Idotea*, **Hamelin, E.** ; *Porcellio*, **Legrand, J. J.** ; Variation, *Tigriopus*, **Božić, B. (1)**.

Classification.—Speciation, **Battaglia, B. (2)** ; Phylogeny and ontogeny, **Spett, G. I.**

ECOLOGY AND HABITS

Ecology.—**Kubo, I. & Asada, E.** ; **Buen, F. de ; Simmons, E. L.** ; Ecology and isolation, **Battaglia, B. (2)**.

Ecology of special forms.—Fauna of leaf litter, **Cloudsley-Thompson, J. L.** ; Zosteraceae associates, **Parenzan, P.** ; Amphipods, **Roznichenko, O. G.** ; Barnacles, **Bousfield, E. L. (2)** ; Brachyura, **Chhappgar, B. F.** ; Life history of *Calanus* in different localities, **Marshall, S. M. & Orr, A. P.** ; *Caridina*, **Kamita, T.** ; *Carcinides*, **Moulton, J. M. & Gustafson, A. H.** ; ecology of Cirripedia, **Zevina, G. B.** ; **Bishop, M. W. H., Crisp, D. J., Fischer-Piette, E. & Prenant, M.** ; freshwater Copepods, **Røen, K. M.** ; Decapoda, **Balss, H.** ; Euphausiacea, **Nepgen, C. S. de V.** ; *Gammarus*, **Bekman, M. Y.** ; **Uéno, M. (1)** ; *Ingolfiella*, **Leleup, N.** ; Littoral Harpacticids, **Noodt, W.** ; Limnoriidae, **Menzies, R. J. (1)** ;

Microsetella, **Fish, C. J.** ; *Neocaridina*, **Kamita, T. (1)** ; *Palaemon*, **Kamita, T. (2)** ; *Panulirus*, **Harada, E.** ; *Pandalus*, **Mistakidis, M. W.** ; *Simocephalus*, **Hoshi, T.** ; *Tylos*, **Arcangeli, A. (1)** ; Woodlice, **Brereton, J. le G.** ; *Uca*, **Altevogt, R.**

Marine ecology.—**Hedgpeth, J. W.** ; **Kinne, O.** ; Black Sea, **Băcesco, M., Dumitresco, H., Manea, V. Por, F. & Mayer, R.** ; Lough Ine, **Sloane, J. F., Ebling, F. J., Kitching, J. A. & Lilly, S. J.** ; Plankton, **Alvarinho, A. (1)** ; **Bossanyi, J.** ; **Chiba, T. & others ; Deevey, G. B.** ; **Ganapati, P. N. & Mohan Rao, V. R.** ; **Glover, R. S.** ; **Guttowa, A.** ; **Kott, P. (1)** ; **Evans, F. & Newell, G. E.** ; **Marcus, A.** ; **Nakai, Z.** ; **Østvedt, O. J.** ; **Rose, M. (1)** ; **Rzoska, J. (3)** ; **Tanaka, O.** ; **Yamazi, I. (1), (2), (3)** ; **Yamazi, I. & Horibata, T.** ; Shore, **Altevogt, R., R. (1)** ; **Picard, J.** ; Marine bottom, **Bossanyi, J.** ; Deep Sea, **Figueira, A. J. G.** ; **Menzies, R. J.** ; Mangrove swamps, **Hartmann, G. (4)**.

Brackish water.—**Hulburt, E. M.** ; **Lockwood, A. P. M. & Croghan, P. C.** ; **Mashiko, K.** ; **Noodt, W.** ; Estuarine, **Tiffon, Y.** ; Sodium bearing waters, **Dvihally, Z. & Ponyi, J.**

Fresh-water Habitats.—Colonisation, **Croghan, P. C.** ; Lakes, **Botnariuc, N., Damian, A., Anastasin, C. & Spătaru, P.** ; **Brook, A. J. & Holden, A. V.** ; **Corbella, C., Croce, N. della & Ravera, O.** ; **Geinrikh, A. K.** ; **Grainger, J. N. R.** ; **Guttowa, A.** ; **Kawamura, T.** ; **Kawamura, T. & Anraku, M.** ; **Kozhova, O. M.** ; **Kubiček, F. & Vlčková, D.** ; **Lindström, T.** ; **Manuylova, E. F.** ; **Moon, H. P.** ; Lake fauna, **Patalas, K.** ; **Rzoska, J.** ; **Serafimovska-Hadzišče, J.** ; **Sertorio, T.** ; **Sublette, J. E., J. E. (1)** ; **Thomasson, K.** ; **Tólp, O.** ; **Voromina, N. M.** ; Lake bottom fauna, **Sublette, J. E.** ; **Tólp, O.** ; Rivers, **Lubyanov, I. P.** ; **Lumberg, A.** ; **Pidgaiko, M. L.** ; Reservoirs, **Pidgaiko, M. L.** ; Ponds and marshes, **Ertl, M.** ; **Smyly, W. J. P. (1)**.

Subterranean.—**Barajon, M.** ; **Borutzki, E. V. (2)** ; **Botasaneanu, L. & Damian, E. (1)** ; **Chappuis,**

P. A. (2) & (3) & (5); **Damian**, A. & **Botosaneanu**, L. & (1); **Farkas**, H. & **Vágvölgyi**, J.; **Fryer**, G.; **Hartmann**, G. (3); **Ito**, T.; **Petkovski**, T. K.; **Petkovski**, T. K. (2); **Pleša**, C.; **Řeháčková**, V.; **Ruffo**, S. (4); **Stella**, E.; **Stráskraba**, M.; **Sunnen**, T.; *Spelaegriphus*, **Gordon**, I.; *Cambarus*, **Wells**, P. H. & **Witt**, A.; *Niphargus*, **Ruffo**, S. (3); *Hyalella*, **Ruffo**, S.; *Salentinella*, **Ginet**, R.; Amphipoda, **Balazuc**, J.; Amphipoda, **Mateus**, A.; *Stenasellus*, **Husson**, R.; Oniscoida, **Brian**, A. & (1) & (3); Isopoda, **Brian**, A. (2); Woodlice, **Legrand**, J. J. (3); Woodlice, **Vandel**, A. (12) & (13); Woodlice, **Strouhal**, H. (2); Isopoda, **Rioja**, E.; *Speocyclops*, **Lindberg**, K. (4); Copepoda, **Brehm**, V. (7); Interstitial, **Botosaneanu**, L. & **Damian**, E. (1); **Damian**, A. & **Botosaneanu**, L.

Terrestrial.—Fauna of leaf-litter, **Cloudsley-Thompson**, J. L.; Soil Fauna, **Haarløv**, N.

Environment effects.—**Pora**, E. A. & **Jitariu**, P.; Polarized light, **Bainbridge**, R. & **Waterman**, T. H. (1); Tropical temp. waters, **Rzoska**, J. (2); Cold wave, **Bigot**, L.; **Aguesse**, P.; Salinity effects, **Battaglia**, B. & **Pulze**, E.; Temperature, **Southward**, A. J.; *Acartia*, **Conover**, R. J. (1); *Balanus*—settlement, **Barnes**, H. (3); *Carcinus*, **Seck**, C.; **Pora**, E. A. & **Jitariu**, P. (1); Environment and sex ratio in *Cyclops*, **Metzler**, S.; Effects of suspended matter on reproduction in *Daphnia*, **Robinson**, M.; *Porcellio*, **Akahira**, Y.; *Tigriopus*, temperature and salinity, **Ranade**, M. R.; *Tisbe*, **Battaglia**, B. (1); *Uca*, temperature effects on melanophores, **Stephens**, G. C.

Introduced faunas.—**Stolyakov**, V. P.; *Brachyotus*, **Naylor**, E. & (2) & (1); *Cambarus*, **Ludwig**, H. W.; Isopoda, **Lindroth**, C. H.; Woodlice, **Muchmore**, W. B.

Acclimatization.—**Petrushevski**, G. K.; *Carcinus* in freshwater, **Wolff**, T.; Mysis, **Zhuravlev**, P. A.

Rhythms and Migrations.—Migration, Plankton, **Grainger**, J. N. R. (1); Rhythms, Barnacles, **Bousfield**, E. L. (2); *Cambarus*, **Guysel**

man, J. B.; Diurnal—Copepoda, **Yamazi**, I. (3); *Calanus*, **Østvedt**, O. J.; *Pandalus*, **Mistakidis**, M. W.; *Orconectes*, **Fingerman**, M. & **Lago**, A. D.; *Uca*, **Fingerman**, M. (1); *Uca*, **Stephens**, G. C.; *Uca*, **Bennett**, M. F., **Shriner**, J. & **Brown**, R.

Seasonal changes.—Plankton Copepods, **Marcus**, A. (1); *Patalas*, K.; **Voronina**, N. M.; **Conover**, R. J.; **Smyly**, W. J. P. (1); Lake Cladocera, **Lindström**, T.; *Acartia*, **Conover**, R. J.; *Canthocamptus*, **Smyly**, W. J. P.; Survival of unfavourable seasons by copepods, **Røen**, K. M.

Population studies.—**Smyly**, W. J. P. (1); **Buen**, F. de; Anostraca, **Massal**, M.; *Canthocamptus*, **Smyly**, W. J. P.; *Daphnia*, **Frank**, P. W., **Boll**, C. D. & **Kelly**, R. W.; *Daphnia*, **Wolf**, K.; *Daphnia*, **Slobodkin**, L. B.; Copepods in lakes, **Eichhorn**, R.; Cladocera, **Rapoport**, E. H.; *Idotea*, **Matsakis**, J.; *Pontogammarus*, **Roznichenko**, O. G.; *Tisbe*, **Battaglia**, B. (1).

Longevity.—*Daphnia*, **Sterba**, G.

Biometrics.—**Barnes**, H.; **Mas-sal**, M.; **Defrise-Gussenhoven**, E. & **Pastels**, A.; Plotting method, **Kesling**, R. V. (1); Vital statistics of *Daphnia*, **Frank**, P. W., **Boll**, C. D. & **Kelly**, R. W.; *Daphnia*, **Wolf**, K.; *Idotea*, **Matsakis**, J.; Oniscoida, **Matsakis**, J. (1); *Siriella*, **Genovese**, S. (1).

Feeding mechanisms.—*Acartia*, **Conover**, R. J. (1); Copepods, **Fryer**, G. (4) & (3); *Mesidotea*, **Green**, J.; Alimentation, *Malacostraca*, **Siewing**, R.

Behaviour.—Effect of polarized light, **Bainbridge**, R. & **Waterman**, T. A. (1); Settlement and orientation of larvae, **Harvey**, L. A.; Amphipods, **Pardi**, L.; *Apus*, **Eason**, D.; *Armadillidium*, **Thompson**, R.; *Armadillidium*, **Iwata**, K. S. & **Watanabe**, M. & (1); Barnacles, **Southward**, A. J.; Attachment of larvae, **Daniel**, A.; Orientation of barnacles to water currents, **Crisp**, D. J. & **Stubblings**, H. G.; *Bosmina*, **Lieder**, K.; *Cambarus*, **Wells**, P. H.; *Carcinides*, **Moulton**, J. M. & **Gustafson**, A. H.; Copulation in copepods, **Gauld**, D. T.; Decapoda, **Balss**, H.; *Dotilla*, **Altevogt**, R. (1); *Gammarus*,

Pattison, P. R. M.; *Limnoria*, **Kampf**, W. D.; *Macrobrachium*, **John**, C. M.; *Panulirus*, **Moulton**, J. M.; *Panulirus*, **George**, R. W.; *Rhithropanopeus*, **McLane**, W. M.; Fiddler crabs, **Schroder**, H. H.; *Uca*, **Altevogt**, R.; **Fingerman**, M. (1); **Crane**, J.

Predators.—**Sokolova**, M. N.; *Panulirus*, **George**, R. W.; birds as predators of lobster larvae, **Mills**, D. H.; *Euphausia* in Humpback Whale, **Marr**, J.

Parasites.—**Smirnova**, K. V.; **Kosheva**, A. F.; **Stolyarov**, V. P.; **Bauer**; **Petrushevski**; **Shchupakov**, I. G.; **Cameron**, T. W. M.; **Shulman**, S. S.; **Akhmerov**, A. K.; **Bauer**, O. N. (1); **Titova**, S. D.; **Grabda**, J. (2); **Northcote**, T. G.; Parasitic castration effects, **Oguro**, C., C. (1); Excystment of ciliates in relation to moulting of crustacean hosts, **Trager**, W.; fish, **Kašták**, V.; *Percichthys*, **Szidat**, L.; Copepoda, **Nunes-Ruivo**, L. (2); **Stekhoven**, J. H. S. & **Stekhoven**, E. W. S.; Eccrinidales on Malacostraca, **Maessen**, K.; Decapoda, **Balss**, H.; Isopoda, **Weibezahn**, F. H. & **Ramirez**, M. V.; Cymothoids, **Bowman**, T. E. & **Diaz-Ungria**, C.; *Astacus*, **Jarvekülg**, A.; *Branchiobdella* on *Astacus*, **Jarvekülg**, A. (1); *Actinothoe* on Crangon, **Pax**, F.; *Anisarthrus*, **Codreanu**, M. & **Codreanu**, R.; *Argulus*, **Davis**, W. S.; *Argulus* on Amphibians, **Goin**, C. J. & **Ogren**, L. H.; *Boeckella* infected with *Dibothriocephalus*, **Bearup**, A. J.; *Bopyrina* on *Hippolytes*, **Motas**, C. & **Băleanu**, A.; *Heterosaccus* on *Portunus*, **Boschma**, H.; *Peroderma*, **Dieuzeide**, R. & **Roland**, J. (1); *Pinnotheres*, **Haven**, D. S.; *Pythium* on *Daphnia*, **Cejp**, K.; *Sacculina*, **Breede**, P. van den; *Salmincola*, **Adams**, J. R.; *Uca*—host of *Maritrema* (Trematoda), **Sarkisian**, L. N.

Commensalism.—**Gotto**, R. V. (3); Decapoda, **Balss**, H.; Hapalocarcinidae, **Fize**, A. & **Serene**, R.; *Limnoria* associates, **Menzies**, R. J. (1); Hyperiidæ Medusæ, **Alvarado**, R.; *Tokophrya* on *Parabathynella*, **Fryer**, G.

GEOGRAPHICAL DISTRIBUTION

Acartia, **Conover**, R. J. (1); *Artemia salina*, **Barigossi**, C.; North Pacific Copepods, **Brodsky**, K. A.; *Balanus*, **Barnes**, H. (1); Decapoda, **Balss**, H.; Euphausiacea, **Zimmer**, C. & **Gruner**, H. E.; Woodlice, **Vandel**, A. (3); Glacial Relicts, **Segerstråle**, S. G.

1. LAND AND FRESHWATER. PALAEARCTIC REGION

Arctic, **Thomasson**, K. (1); **Segerstråle**, S.; N. Europe, **Segerstråle** (1); **Lohmander**, H.; Central Europe, **Brehm**, V. (7); **Ginet**, R. (1); **Järvekülg**, A.; **Orghidan**, T.

S. Europe.—**Vandel**, A. (2).

Atlantic Islands.—Cape Verde, **Vandel**, A. (1); Cuba, **Rioja**, E.; Madeira, **Vandel**, A. (7); **Arcan-geli**, A.

British Isles.—**Brereton**, J. le G.; **Bassindale**, R. & **Barnett**, J. H.; **Brook**, A. J. & **Holden**, A. V.; **Grainger**, J. N. R.; **MacDonald**, J. D., **Pike**, R. B. & **Williamson**, D. I.; **MacDonald**, R.; **Macan**, T. T. & **Mackereth**, J. C.; **Mitchell**, G. F.; **Moon**, H. P. & (1); **Smyly**, W. J. P. (1).

Denmark.—**Wolff**, T.; **Røen**, K. M.; **Haarløv**, N.

Finland.—**Koli**, L.

Sweden.—**Lindström**, T.

Poland.—**Grabda**, J. (2); **Kozikowska**, Z. & (1).

Germany.—**Butin**, H.; **Gruner**, H. E.; **Kiefer**, F.; **Ludwig**, H. W.; **Noodt**, W. (3); **Schellenberg**, A.

Switzerland.—**Hynes**, H. B. N.

Austria.—**Schubert**, P.

Belgium.—**Polk**, Ph.

Holland.—**Sunnen**, T.

France.—**Aguesse**, P. & (1); **Aguesse**, P. C. & **Dussart**, B.-H.; **Balazuc**, J.; **Bigot**, L. & (1); **Chapuis**, P. A. (1), (2) & (5); **Ginet**, R. & (2); **Joly**, R.; **Legrand**, J. J. (3); **Lindberg**, K. (4); **Pourriot**, R.; **Tiffon**, Y.; **Vandel**, A. (5).

Italy.—Barajon, M. ; Brian, A. & (1) & (3) ; Corbella, C., Croce, N. della & Ravera, O. ; Ruffo, S. (3), (4) & (6).

Corsica.—Lindberg, K.

Spain.—Ortiz, E.

Mediterranean Islands.—Sardinia, Stella, E.

Czechoslovakia. — Cejp, K. ; Černý, W. & Stráskraba, M. ; Ertl, M. ; Kubiček, F. & Vlčková, D. ; Šrámek-Hušek, R. ; Štěrba, O. & (2) ; Straškraba, M.

Hungary.—Beretz, P. & others ; Dvihal, Z. & Ponyi, J. ; Farkas, H. & Vágvolgyi, J. ; Kertész, G. ; Ponyi, E. & (1)–(3) ; Ponyi, J.

Yugoslavia.—Ertl, M. ; Kašák, V. ; Karaman, S. L. & (1) ; Petkovski, T. K. (1) & (2). **Serfimoska-Hadžišče,** J.

Roumania.—Bănărescu, P. & Șerban, M. ; Botosaneanu, L. & Damian, A. (1) ; Botosaneanu, L. & Por, F. ; Botnariuc, N., Damian, A., Anastasiu, C. & Spătaru, P. ; Damian, A. ; Damian, A. & Botosaneanu, L. & (1) ; Dobreanu, E. & Manolache, C. & (1) ; Pleșa, C. & (1) ; Por, F. ; Puscariu, V.

Greece.—Lindberg, K. (3) & (5) ; Strouhal, H. (1) ; Vandell, A. (12) & (13).

Bulgaria.—Štěrba, O. (1).

Asia Minor.—Kiefer, F.

Turkey.—Lindberg, K. (6) ; Strouhal, H. (2).

USSR.—Akhmerov, A. K. ; Bauer, O. N. ; Bekman, M. Y. ; Birstein, J. A. & Vinogradov, L. G. ; Borutzky, E. V. & (1) & (2) ; Borovitzkaya, M. P. ; Gavrilov, G. B. & (1) ; Geinrikh, A. K. ; Gromov, V. V. ; Kosheva ; Lindberg, K. (7) ; Lubyantsev, I. P. (1) ; Lumberg, A. ; Mäemets, A. & Veldre, I. ; Petruschewsky, G. (1) ; Ponomareva, L. A. ; Smirnova ; Shchupakov, I. G. ; Shulman, S. S. ; Titova, S. D. ; Tólp, O. ; Veldre, I. & Mäemets, A. ; Vinogradov, M. E. (1) ; Zhuravel, P. A.

Inner Mongolia.—Shen, C.

China.—Chang-tung, K. & Kangan, W.

Japan.—Ito, T. & (1) ; Kamita, T. (1) & (2) ; Kawamura, T. &

Anraku, M. ; Kikuchi, H. ; Mashiko, K. ; Morikawa, K.

North Africa.—Amar, R. (2) ; Massal, M. ; Nourisson, M. ; Rzoska, J. (3) ; Strouhal, H. Vandell, A. (10).

Asia Minor.—Vandell, A.

ORIENTAL REGION

India.—Iyengar, H. D. R. & Basavaiah, N. ; Iyengar, H. D. R. & Venkatesh, K. ; Krishnaswamy, S.

Reunion Islands.—Chappuis, P. A. (3).

AUSTRALIAN REGION

Australia.—Herbst, H. V. & (1) ; Woods, J. T.

ETHIOPIAN REGION

East Africa.—Fryer, G. & (1) ; Harding, J. P. ; Lindroth, S. ; Kiefer, F. (2) ; Rzoska, J. (1) & (2).

West Africa.—Harding, J. P. (1) ; Onabamiro, S. D.

South Africa.—Barnard, K. H. (1) ; Chappuis, P. A. & Delamare Deboutteville, C. L. ; Gordon, I.

NEARCTIC REGION

North America.—Brooks, J. L.

Canada.—Northcote, T. G.

Newfoundland.—Bousfield, E. L. (1)

U.S.A.—Causey, D. (3) ; Chappuis, P. A. ; Crocker, D. W. ; Ferguson, E., Jr. & (1) & (2) ; Hobbs, H. H. & Walton, M. ; Hulburt, E. M. ; Muchmore, W. B. ; Penn, G. H. (1) ; Sublette, J. E. & (1).

CENTRAL AMERICA

Mexico.—Brehm, V. (1).

SOUTH AMERICA

South America.—Biraben, M. & (1) ; Bowman, T. E. & Diaz-Ungria, C. ; Brehm, V. & (2) & (3) ; Brian, A. (2) ; Castro, A. L. de ; Hartmann, G. (3) ; Kiefer, F. (1) ; Lindberg, K. (3) ; Oliveira, L. P. H. de ; Ruffo, S. ; Thomasson, K. ; Weibezahn, F. H. & Ramirez, M. V. ; Sanfilippo, N.

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Arctic.—**Blacker, R. W. ; Johnson, M. W. (1) ; Savilov, A. I.**

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Seas of USSR.—**Tarasov, N. E. & Zevina, G. B.**

North Atlantic.—**Blacker, R. W. ; Bishop, M. W. H. & Crisp, D. J. ; Figueira, A. J. G. ; Fish, C. J. ; Schroeder, W. C. (European side).**—**Alvariño, A. ; Bishop, M. W. H., Crisp, D. J., Fischer-Piette, E. & Prenant, M. ; Bocquet, C. & Stock, J. H. ; Brehm, V. (6) ; Delamare Deboutteville, C. ; Fischer-Piette, E. & Prenant, M. ; Glover, R. S. ; Labat, R. ; Nouvel, H. & Holthuis, L. B. ; Noodt, W. (1) ; Williamson, D. I. (American side).**—**Broad, A. C. ; Bousfield, E. L. & (1) & (2) ; Chace, F. A. ; Conover, R. J. (1) ; Darnell, R. M. & Williams, A. B. ; Deevey, G. B. ; Dunbar, M. J. ; Menzies, R. J. ; Rees, C. B. ; Texas, Simmons, E. G. ; Squires, H. J. ; Steinberg, J. E. & Dougherty, E. C. ; Wass, M. L.**

English Channel.—**Battaglia, B. (1) ; Bocquet, C. & Stock, J. H. & (1).**

British coasts.—**Beard, D. M. ; Cutcliffe, A. S. ; Conover, R. J. ; Elmhirst, R. ; Gotto, R. V. ; Gooding, R. V. ; Mistakidis, M. N. ; Naylor, E. & (1) & (3) ; Ranade, M. R. ; Williamson, D. I.**

North Sea.—**Bossanyi, J. ; Codreanu, M. & Codreanu, R. ; Holmquist, C. (1) ; Kabata, Z. ; Noodt, W. & (3) ; Østvedt, O. J.**

Baltic.—**Noodt, W.**

Adriatic.—**Petkovski, T. K. (2) & (3) & (4).**

Caspian. — **Mordukhai-Boltovskoi, F. D. (1).**

Black Sea.—**Bacesco, M. & (1) ; Bacesco, M., Dumitresco, H., Manea, V., Por, F. & Mayer, R. ; Braginskyi, L. P. (1) ; Cărașu, S. & Cărașu, A. ; Cihodaru, M. ; Jaku-**

bisiak, St. ; Marcus, A. & (1) ; Pauli, V. L. ; Pora, E. A. ; Pora, E. & Bacesco, M. ; Pora, E. & Cărașu, S. ; Pora, E. A. & Jitariu, P. & (1) ; Serban, M. & Plesa, C.

Mediterranean. — **Amar, R. ; Alvariño, A. (1) ; Arcangeli, A. ; Battaglia, B. (1) ; Dienzeide, R. & Roland, J. ; Délye, G. ; Dow, T. G. & Menzies, R. J. ; Forest, J. (1) & (2) ; Humes, A. G. & (1) ; Iyigüngör, D. ; Nouvel, H. & Holthuis, L. B. ; Parenzan, P. ; Ruffo, S. (5) ; Sanchez, S. ; Sertorio, T. ; Solland, E. ; Taramelli, E. (1) ; Zariquiey, R.**

North Pacific.—**Brodsky, K. A. ; Chiba, T., Tsuruta, A. & Maéda, H. ; Brown Islands, Geinrich, A. K. (1) ; Henry, D. P. ; Ponomareva, L. A. (2) ; Uéno, M. (1) ; (Japanese waters).**—**Birstein, J. A. ; Haneda, Y. ; Harada, E. ; Hanai, T. & (2) ; Hiro, F. ; Honjo, K. ; Honjo, K., Ohta, H., Kidachi, T., Umeda, K. & Kudoh, S. ; Kado, Y. ; Kubo, I. & Asada, E. ; Mori, T. ; Miyake, S. ; Nakai, Z. ; Nakai, Z. & others ; Stschapova, T. F., Mokyevsky, O. B. & Pasternak, F. A. ; Tanaka, O. & (1) & (2) ; Shen, C. & Bai, S. ; Shirase, S. & Yanagimache, R. ; Shiino, S. M. & (1)–(6) ; Uéno, M. ; Vinogradov, M. E. ; Yamazi, I. & (1–3) ; Yamazi, I. & Horibata, T. ; (N.E. Pacific).—**Barnard, J. L. & (1–4) ; Haig, J. & (1).****

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Indo-Pacific.—**Ganapati, P. W. & Mohan Rao, V. R. ; Menzies, R. J. (1) ; Pillai, N. K. (1) (Red Sea) Gohar, H. A. F. & Al-Kholy, A. A. & (1) & (2) (Indian Ocean) Barnard, J. L. (4) ; Brehm, V. (4) ; Chhap-**

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Australian waters.—Dall, W. ; George, R. W. ; Kott, P. & (1) ; Marr, J. ; Racek, A. A. & (1) ; Stephenson, W. ; Hudson, J. J. & Campbell, B. ; Stephenson, W. & Hudson, J. J.

New Zealand waters.—Hurley, D. E. & (1) & (2) ; Jolly, V. H. ; Yaldwyn, J. C. & (1).

South Pacific.—Bahamonde, N. ; Garth, J. S. ; Garth, J. S. & Haig, J. ; Holmquist, C. ; Nilsson-Cantell, C. A. ; Ruffo, S. (2).

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Cambrian.—Seilacher, A.

Ordovician.—Amsden, T. W. ; Andreeva, D. N. ; Harris, R. W. ; Jaanusson, V. ; Sarv, L. I. ; Swain, F. M.

Silurian.—Copeland, M. J. (1) ; Kesling, R. V. & Wagner, P. L. ; Macarovič, N. ; Martinsson, A. ; Meléndez, B. ; Tchernyshev, B. I. (1).

Devonian.—Coley, T. B. ; Copeland, M. J. ; Filippova, M. F. & Aronova, S. M. ; Glebovskaya, E. M. ; Howell, B. F. ; Kesling, R. V. & Soronen, G. C. ; Kesling, R. V. (2) ; Krömmelbein, K. ; Kupfahl, H.-G. ; Novozhilov, I. & Varentzov, I. M. ; Postnikova, I. E. ; Liaschenko, A. I. & Efremova, L. N. ; Wells, J. W.

Carboniferous.—Brückner, W. D. ; Copeland, M. J. (2) ; Defrise-Gussenhoven, E. & Pastsels, A. ; Defretin, S. ; Feys, R. ; Glaessner, M. F. (2) ; Novozhilov, N. I. ; Semikhatova, S. V. ; Tchernyshev, B. I. ; Zanina, I. E. ; Zaspelova, V. S.

Permian.—Brückner, W. D. ; Glaessner, M. F. (3) ; Khalfin, L. L. ; Mandelshtam, M. I. ; Migacheva, E. E. & Strelin, B. P. ; Novozhilov, N. I.

MEZOZOIC

Arsenyev, A. A. ; Saidov, M. N.

Triassic.—Liubimova, P. S. ; Mandelshtam, & others ; Marlière, R. (1) ; Migacheva, E. E. & Strelin, B. P. ; Trümper, R.

Jurassic.—Bernard, F. ; Bizon, J. J. & Oertli, H.-J. ; Defretin, S. ; Joulia, F. & Lapparent, A. F. de ; Grekoff, N. (1) ; Liubimova, P. S. ; Mauberge, P. L. ; Malz, H. ; Martin, G. P. R. & Weiler, W. ; Mandelshtam, M. I. & others ; Novojilov, N. (1) ; Oertli, H. J. ; Peterson, J. A. ; Wicher, C. A.

Cretaceous.—Bolin, E. J. ; Butler, E. A. & Jones, D. E. ; Ferasin, F. & Decima, F. P. ; Fleming, C. A. ; Glaessner, M. F. (1) ; Grekoff, N. (1) ; Hill, B. L. ; Kesling, R. V. & Reimann, I. G. ; Laurencich, L. ; Mandelshtam, M. I. & others ; Mertens, E. ; Remy, J. M. & Avnimelech, M. ; Saint-Seine, R. de (1) ; Woods, J. T. ; Wicher, C. A.

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Hill, B. L. ; MacNeil, F. S. ; Puri, H. S. ; Saidov, M. N. ; Solovyev, V. F.

Paleocene.—Bold, W. H. van den (1) ; Slansky, M.

Eocene.—Glaessner, M. F. (1) ; Keij, A. J. ; Kolosváry, G.

Oligocene.—Boda, J. ; Bold, W. A. van den ; Gorbach, L. P. ; Keij, A. J.

Miocene.—Grekoff, N. & Moyes, J. ; Imaizume, R. & (1) ; Ivanchuk, L. F. & Ivanchuk, P. P. ; McLean, J. D., Jr. ; Palmer, A. R. ; Pobedina, & others ; Vokes, H. E.

Pliocene.—Hanai, T. & (2) ; Mandelshtam, M. I. & others ; Schenk, E.

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Pleistocene.—Boda, J. ; Feyling-Hanssen, R. W. ; Fleming, C. A. ; Hayward, J. F. ; Ludbrook, N. H. ; Schenk, E.

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